WATER QUALITY ANALYSIS

DAC_Phase2

Simplified step-by-step procedure for implementing anomaly detection in water quality parameters:

1. Data Collection:

- Gather historical data on water quality parameters like pH, turbidity, dissolved oxygen, etc.
- Ensure the dataset includes both normal and anomalous instances.

2. Data Preprocessing:

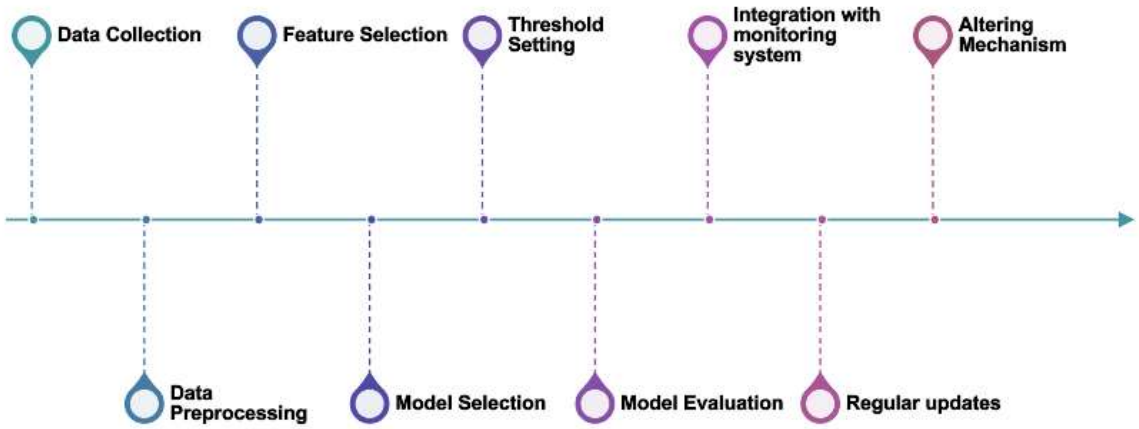
- Clean the data by handling missing values and outliers.
- Normalize or standardize the features to bring them to a similar scale.

3. Feature Selection:

- Identify relevant features that contribute to water quality assessment.
- Exclude redundant or irrelevant features that might introduce noise.

4. Model Selection:

- Choose an appropriate anomaly detection model. Common options include Isolation Forest, One-Class SVM, or autoencoders for deep learning.



5. Model Training:

- Train the selected model on the cleaned and preprocessed dataset, using only normal instances.

- This helps the model learn the typical patterns of normal behavior.

6. Threshold Setting:

- Establish a threshold for anomaly scores or distances.

- Instances with scores exceeding this threshold are considered anomalies.

7. Model Evaluation:

- Evaluate the model on a separate validation set, including both normal and anomalous instances.

- Adjust the threshold to achieve the desired balance between false positives and false negatives.

8. Integration with Monitoring System:

- Implement the anomaly detection model within the water quality monitoring system.

- Set up real-time monitoring for continuous assessment.

9. Regular Updates:

- Periodically retrain the model with new data to adapt to changing patterns and maintain accuracy.

10. Alerting Mechanism:

- Establish an alerting system to notify relevant personnel when an anomaly is detected.

- Include details about the nature of the anomaly for quick response.